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SUMMARY REPORT ON QUALITY OF INTERSTATE WATERS

JAMES RIVER (NORTH DAKOTA - SOUTH DAKOTA)

PUBLIC HEALTH SERVICE, WASHINGTON, D.C.

JANUARY 1963

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(NORTH DAKOTA - SOUTH DAKOTA)

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16. Abstracts
Water quality of the James River and its tributaries in North and South Dakota in 1963 was examined. Tabular data are provided regarding: sources of pollution, stream flow, interference with water uses, adequacy of treatment measures, action of official agencies, Public Health Service grants for construction of waste treatment facilities, nature of delays in abating pollution, and time schedule for proposed remedial action. A brief bibliography is included.

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17b. Identifiers/Open-Ended Terms

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James River
North Dakota
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17c. COSATI Field/Group 13B

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SUMMARY REPORT ON QUALITY OF INTERSTATE WATERS

JAMES RIVER

(NORTH DAKOTA-SOUTH DAKOTA)

This report, one of a series developed by the Public Health Service, is a factual presentation of conditions which exist in a specific location or area, based on data and information furnished by State, Interstate and Federal agencies concerned. This report is a brief summary of such material in the files of the Public Health Service as of the time the report is issued. The report will be revised from time to time to reflect new information and changing conditions.

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Public Health Service

January 1963

SUMMARY REPORT ON QUALITY OF INTERSTATE WATERS

JAMES RIVER

(NORTH DAKOTA-SOUTH DAKOTA)

(Data Current to January 1, 1963)

I. LOCATION

The James River rises west of Fessenden, North Dakota, (east central North Dakota), flows east for a short distance, and then follows a general southerly course through South Dakota to its confluence with the Missouri River east of Yankton, South Dakota (river mile M-798)[1/]. The stream crosses the North Dakota-South Dakota State Line at approximate river mile 459.

The largest municipalities in this predominantly agricultural basin are Jamestown, North Dakota (population 15,163); Aberdeen, South Dakota (population 23,073); Huron, South Dakota (population 14,180); and Mitchell, South Dakota (population 12,555).

Of the principal tributaries to the James, two are interstate; the Elm River (river mile 429) and the Maple River (river mile 429-45). Other major tributaries are Pipestem Creek (river mile 578), Snake Creek (river mile 300), Turtle Creek (river mile 290), and Firesteel Creek (river mile 131). The Maple River is the subject of a separate summary report.

II. SOURCES OF POLLUTION

Two major sources of interstate pollution are the municipalities of LaMoure and Oakes, North Dakota. In addition, there are several areas in the James River Basin where intrastate pollution exists, as indicated in the following table.

1/ All Missouri River mileages have been updated in accordance with the U.S. Army Corps of Engineers' 1960 figures.

TABLE NO. 1 - BASIC DATA ON SOURCES OF POLLUTION 2/

Municipality or Industry	River Miles Above Mouth	Sewered Population	P.E. Waste Before Treatment	Nature of Wastes	Treatment Provided	P.E. Discharge to water-course
James River						
Fessenden, N.D.	Undet.	700	700	Munic.	Lagoon	0
New Rockford, N.D.	665	1,800	2,300	Munic.& Industrial	Septic tank	2,300
Kelly Creek	640					
Carrington, N.D.	640-21	1,730	3,855E 3/	Munic. & Industrial	Lagoon	0
James River						
Pipestem Creek	578					
Jamestown, N.D.	578-2					
Stock Sales Co.		N.A.	400	Misc. Food	None	400
James River						
Jamestown, N.D.	577	14,250	16,800E	Munic.& Industrial	Lagoon	0
Jamestown RR Shop		N.A.	100	Industrial	None	100
State Hospital		2,375	2,375	Sanitary	Lagoon	0
Beaver Creek	555					
Gackle, N.D.	555-50	500	500	Munic.	Primary (Discharged to land)	0
James River						
LaMoure, N.D.	506	850	2,170	Munic.& Industrial	None	2,170
Oakes, N.D.	484	1,420	2,000	Munic.& Industrial	None	2,000

2/ U. S. Department of Health, Education, and Welfare, Public Health Service, 1957 Inventory, Municipal and Industrial Waste Facilities, 1958, PHS Publication No. 622, Vol. 6; Region VI files; and the appropriate States involved.

3/ E - Estimated

TABLE NO. 1 - BASIC DATA ON SOURCES OF POLLUTION 2/

Municipality or Industry	River Miles Above Mouth	Sewered Population	P.E. Waste Before Treatment	Nature of Wastes	Treatment Provided	P.E. Discharged to water-course
State Line (N. Dakota-S. Dakota)	459					
Hecla, S.D.	450E	440	700	Munic.	Lagoon	50E
Tributary	429E					
Claremont, S.D.	429-Undet.	240	240	Munic.	Lagoon	20E
Moccasin Creek	378					
Foot Creek	378-43-4					
Leola, S.D.	378-43-67	830	1,100E	Munic.	Lagoon	100E
Aberdeen, S.D.	378-43-4					
Gerharter Bros. Processing		N.A.	500E	Slaughtering & Mt. Packing	None	500
Moccasin Creek	378					
Aberdeen, S.D.	378-43	23,000	23,000E	Munic.	Secondary	6,000
James River						
Mud Creek	338					
Britton, S.D.	338-70	1,400	2,000	Munic. & Industrial	Lagoon	200E
Bristol, S.D.	338-65	560	960E	Munic. & Industrial	Secondary (Discharged to landlocked lake bed)	0
Pierpont, S.D.	338-48	250	250E	Munic.	Primary	175E
Andover, S.D.	338-43	220	220E	Munic.	None	220E
Groton, S.D.	338-36	1,060	1,060E	Munic. & Industrial	Lagoon	100E
James River Tributary	335					
Mellette, S.D.	335-4	200	200E	Munic.	Small Pond	100E

TABLE NO. 1 - BASIC DATA ON SOURCES OF POLLUTION 2/

Municipality or Industry	River Miles Above Mouth	Sewered Population	P.E. Waste Before Treatment	Nature of Wastes	Treatment Provided	P.E. Discharge to water-course
James River						
Ashton, S.D.	315	150E	150E	Munic.	None	150E
James River						
Snake Creek	300					
Ipswich, S.D.	300-90	1,100	1,100E	Munic.	Secondary	200E
Nixon River	300-10					
W. Branch Snake Creek	300-10-20					
Cresbard, S.D.	300-10-20-25	225	225E	Munic.	Lagoon	20E
Nixon River	300-10					
Faulkton, S.D.	300-10-65	1,050	1,050E	Munic.	Lagoon	100E
James River						
Turtle Creek	290					
Highmore, S.D.	290-120	1,070	1,070E	Munic.	None	1,070E
Miller, S.D.	290-95	2,050	2,050E	Munic.	Secondary	350E
St. Lawrence, S.D.	290-90	280	280E	Munic.	Primary	200E
Redfield, S.D.	290-2	2,950	3,540E	Munic. & Industrial	Lagoon	200E
State Hospital & School		1,200	1,200	Sanitary	Lagoon	100E
James River						
Creek	280					
Frankfort, S.D.	280-3	230	230E	Munic.	None	230E
James River						
Thunder Creek	248					
Conde, S.D.	248-Undet.	380	380E	Munic.	Lagoon	30E
Doland, S.D.	248-36	480	480E	Munic.	None	480E

TABLE NO. 1 - BASIC DATA ON SOURCES OF POLLUTION 2/

Municipality or Industry	River Miles Above Mouth	Sewered Population	P.E. Waste Before Treatment	Nature of Wastes	Treatment Provided	P.E. Discharge to water-course
James River						
Foster Creek	248					
Clark, S.D.	248-47	1,460	2,170E	Municipal & Industrial	Secondary	435E
James River						
Huron, S.D.	222	14,000	42,700 4/	Municipal & Industrial	Secondary	8,600 5/
Cain Creek	214					
Wessington,S.D.	214-63	370	370E	Municipal	Lagoon	40E
Wolsey,S.D.	214-41	350	350E	Municipal	None	350E
James River						
Pearl Creek	212					
South Fork	212-5					
Iroquois,S.D.	212-5-27	380	380E	Municipal	Primary	300E
James River						
Redstone Creek	188					
Willow Lake,S.D.	188-90	460	460E	Municipal	Primary	290E
Carthage,S.D.	188-37	360	360E	Municipal	Primary	250E
James River						
Woonsocket,S.D.	177	800	1,000E	Municipal & Industrial	None	1,000E
Unnamed Creek	170					
Artesian,S.D.	170-10	320	320E	Municipal	None	320E

4/ 61,000 in fall and early winter
5/ 16,400 in fall and early winter

TABLE NO. 1 - BASIC DATA ON SOURCES OF POLLUTION 2/

Municipality or Industry	River Miles Above Mouth	Sewered Population	P.E. Waste Before Treatment	Nature of Wastes	Treatment Provided	P.E. Discharge to water-course
James River						
Firesteel Creek	139					
Wessington Springs,S.D.	139-90	1,480	1,800E	Municipal & Industrial	Lagoon	150E
James River						
Mitchell,S.D.	138	12,500	35,000	Municipal & Industrial	Secondary	3,500E
Unnamed Creek	137					
Mitchell Packing Co.	137-1	N.A.	2,290	Industrial	None	2,290
Mylan Meat Co.	137-2	N.A.	855E	Meat Packing	Septic Tank & Soil Absorption	0
James River						
Enemy Creek	131					
Plankinton,S.D.	131-67	640	640E	Municipal	Lagoon	60E
State Training School		200	300E	Sanitary	Secondary	45E
Mt. Vernon,S.D.	131-60	370	370E	Municipal	None	370E
James River						
Pierre Creek	124					
Alexandria,S.D.	124-6	600	700E	Municipal	Primary	490E
James River						
Twelve Mile Creek	97					
Ethan,S.D.	97-20					
Ethan Dairy Products		N.A.	190E	Creamery	Septic Tank & Soil Absorption	0

TABLE NO. 1 - BASIC DATA ON SOURCES OF POLLUTION 2/

Municipality or Industry	River Miles Above Mouth	Sewered Population	P.E. Waste Before Treatment	Nature of Wastes	Treatment Provided	P.E. Discharge to water-course
South Fork	97-4					
Dimock,S.D.	97-4-13					
Dimock Dairy Products		N.A.	280	Creamery	Septic Tank & Soil Absorption	0
Twelve Mile Creek	97					
Pony Creek	97-2					
Parkston,S.D.	97-2-16	1,500	1,800E	Municipal & Industrial	Lagoon	200E
James River						
Wolf Creek	83					
Spencer,S.D.	83-47	450	450E	Municipal	Secondary	100E
Emery,S.D.	83-32	500	500E	Municipal	Primary	400E
Bridgewater,S.D.	83-23	690	690E	Municipal	None	690E
James River						
Dawson Creek	33					
Scotland,S.D.	33-6	1,070	1,400E	Municipal & Industrial	Lagoon	100E
James River						
Furlong Creek	25					
Menno,S.D.	25-6	830	1,275E	Municipal & Industrial	Secondary	600E

To date, discharges to the James River from sources of pollution in North and South Dakota have continued as indicated above.

TABLE NO. 2 - STREAM FLOW DATA IN CFS 6/

No. and Location of Gaging Station	River Mile	Years of Record	Average	Maximum	Minimum
4700 James River at Jamestown, N.D.	575	25	51.1	6,390	0
4705 James River at LaMoure, N.D.	506	10	62.4	5,730	0
4710 James River at Columbia, S.D.	433	15	98.2	5,420	0
4760 James River at Huron, S.D.	222	21	214	6,050	0
4785 James River near Scotland, S.D.	33	32	335	13,900	0

Periods of little or no flow are quite common throughout the James River Basin. During these low flow intervals, pollution of the River occurs at the North Dakota-South Dakota State Line, downstream from the municipalities of LaMoure and Oakes, North Dakota. Severe oxygen depletions were detected in stream studies made in February, August, and September, 1951. 7/

III. INTERFERENCE WITH WATER USES 8/

Wastes discharged into the James River from sources in North Dakota interfere with water uses in South Dakota by causing:

6/ U.S. Department of Interior, Geological Survey, Surface Water Supply of the United States, 1960, Part 6-A, Missouri River Basin Above Sioux City, Iowa, U. S. Government Printing Office, 1961, Geological Survey Water Supply Paper 1709.

7/ Federal Security Agency, Public Health Service, North Dakota Department of Health, South Dakota Department of Health, James River Drainage Basin, A Cooperative State-Federal Report on Water Pollution, April 1952, PHS Publication No. 187.

8/ See Appendix A.

Deterioration of water quality so as to detrimentally affect the propagation of fish life. Zero dissolved oxygen values have occurred during winter months when ice cover minimized natural stream aeration, and DO values less than 4 ppm have been reported during summer months.9/ No fish kills are known to have been reported.

IV. ADEQUACY OF TREATMENT MEASURES

All of the municipalities and industries listed in Table No. 1 which provide adequate treatment have been omitted from the following table.

Municipality or Industry	Treatment Needs
New Rockford, N.D.	Replace plant (Lagoon being planned)
Jamestown, N.D.	
Stock Sales Co.	Treatment facilities
Jamestown RR Shop	Treatment facilities
Gackle, N.D.	Replace plant
LaMoure, N.D.	Treatment facilities
Oakes, N.D.	Treatment facilities
Aberdeen, S.D.	Enlarge plant
Gerharter Bros. Processing	Treatment facilities
Andover, S.D.	Treatment facilities
Mellette, S.D.	Treatment facilities (Lagoon being planned)
Ashton, S.D.	Treatment facilities (Lagoon being planned)
Highmore, S.D.	Treatment facilities
St. Lawrence, S.D.	Replace plant

9/ Same as 7

Municipality or Industry	Treatment Needs
Frankfort, S.D.	Treatment facilities (Lagoon being planned)
Doland, S.D.	Treatment facilities (Lagoon being planned)
Huron, S.D.	Enlarge plant
Wolsey, S.D.	Treatment facilities
Iroquois, S.D.	Replace plant
Willow Lake, S.D.	Addition of other treatment methods
Carthage, S.D.	Replace plant
Woonsocket, S.D.	Treatment facilities (Lagoon being planned)
Artesian, S.D.	Treatment facilities
Mitchell, S.D.	
Mitchell Packing Co.	Treatment facilities
Mt. Vernon, S.D.	Treatment facilities
Alexandria, S.D.	Replace plant
Emery, S.D.	Replace plant
Bridgewater, S.D.	Treatment facilities
Menno, S.D.	Addition of other treatment methods

V. ACTION OF OFFICIAL AGENCIES

Federal and Federal-State Joint Action

At the request of an in cooperation with the Bureau of Reclamation, the "James River Basin Water Pollution Investigation" was prepared by the Public Health Service and the Departments of Health of North Dakota and South Dakota in April 1952. This document provided a large amount of water quality information on the James River and its tributaries. Also included in the report were pollution abatement needs of communities throughout the watershed.

In July 1953, the joint Public Health Service-Missouri Basin States report, "A Comprehensive Program for Control of Water Pollution, Missouri Drainage Basin," was published. This document established pollution abatement requirements on the Missouri River and its tributaries. The James River was included in this publication.

Since the publishing of the above reports, substantial progress toward construction of needed waste treatment works has resulted throughout most of the James Basin. In addition, the aforementioned 1952 report recommended that the municipalities of LaMoure and Oakes, North Dakota provide secondary treatment facilities. To date, these cities have not constructed the needed pollution abatement facilities, but are in the planning stage. The remedial facilities are expected to be under construction in 1963.

The following table indicates Federal participation in construction of sewage treatment works in the James River Watershed.

TABLE NO. 3 - PUBLIC HEALTH SERVICE GRANTS FOR CONSTRUCTION OF WASTE TREATMENT FACILITIES

Municipality	Date Approved	Amount	Estimated Total Cost of Project	Type of Project	Status of Project
New Rockford, N.D.	6/26/62	$ 27,000	$ 95,000	Lagoon	Planning
Carrington, N.D.	1/26/61	14,969	59,191	Lagoon	Completed
Jamestown, N.D.	4/20/60	25,068	173,102	Interceptor sewer	Completed
Jamestown, N.D.	2/26/57	26,925	91,157	Enlarge lagoon	Completed
State Hospital	2/20/58	62,051	208,230	Lagoon	Completed
Hecla, S.D.	2/14/61	17,045	131,984	Lagoon	Completed
Claremont, S.D.	2/17/60	8,081	54,949	Lagoon	Completed
Leola, S.D.	4/28/59	8,465	29,949	Lagoon	Completed
Britton,S.D.	11/24/58	12,517	41,722	Lagoon	Completed
Groton, S.D.	12/3/57	14,233	48,794	Lagoon	Completed
Mellette, S.D.	5/6/59	7,392	24,639	Lagoon	Planning
Cresbard, S.D.	10/14/58	5,186	20,970	Lagoon	Completed
Faulkton, S.D.	9/18/58	9,024	36,124	Lagoon	Completed
Redfield, S.D. State Hospital & School	3/10/59	19,108	63,692	Lagoon	Completed
Conde, S.D.	11/18/58	4,433	78,538	Lagoon	Completed
Clark, S.D.	7/22/58	7,655	28,310	Additions & improvements to plant	Completed
Woonsocket, S.D.	6/19/59	15,434	185,032	Lagoon	Planning
Wessington S Springs, S.D.	3/28/60	5,482	18,272	Lagoon	Completed

TABLE NO. 3 - PUBLIC HEALTH SERVICE GRANTS FOR CONSTRUCTION OF WASTE TREATMENT FACILITIES

Municipality	Date Approved	Amount	Estimated Total Cost of Project	Type of Project	Status of Project
Mitchell, S.D.	3/28/58	$ 135,000	$ 450,573	Addition to plant	Completed
Plankinton, S.D.	7/13/61	2,934	12,429	Lagoon	Completed
Parkston, S.D.	4/2/57	14,276	47,587	Lagoon	Completed
Scotland, S.D.	4/7/59	6,117	24,587	Lagoon	Completed

VI. NATURE OF DELAYS IN ABATING POLLUTION

The delays at LaMoure and Oakes, North Dakota are due to financial problems on the part of the communities, and difficulties in securing suitable land.

VII. TIME SCHEDULE FOR PROPOSED REMEDIAL ACTION

The North Dakota State Department of Health is very hopeful that the municipalities of LaMoure and Oakes will develop adequate waste treatment facilities during 1963.

BIBLIOGRAPHY

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2. Federal Security Agency, Public Health Service, North Dakota Department of Health, South Dakota Department of Health, James River Drainage Basin, A Cooperative State-Federal Report on Water Pollution, April 1952, PHS Publication No. 187.

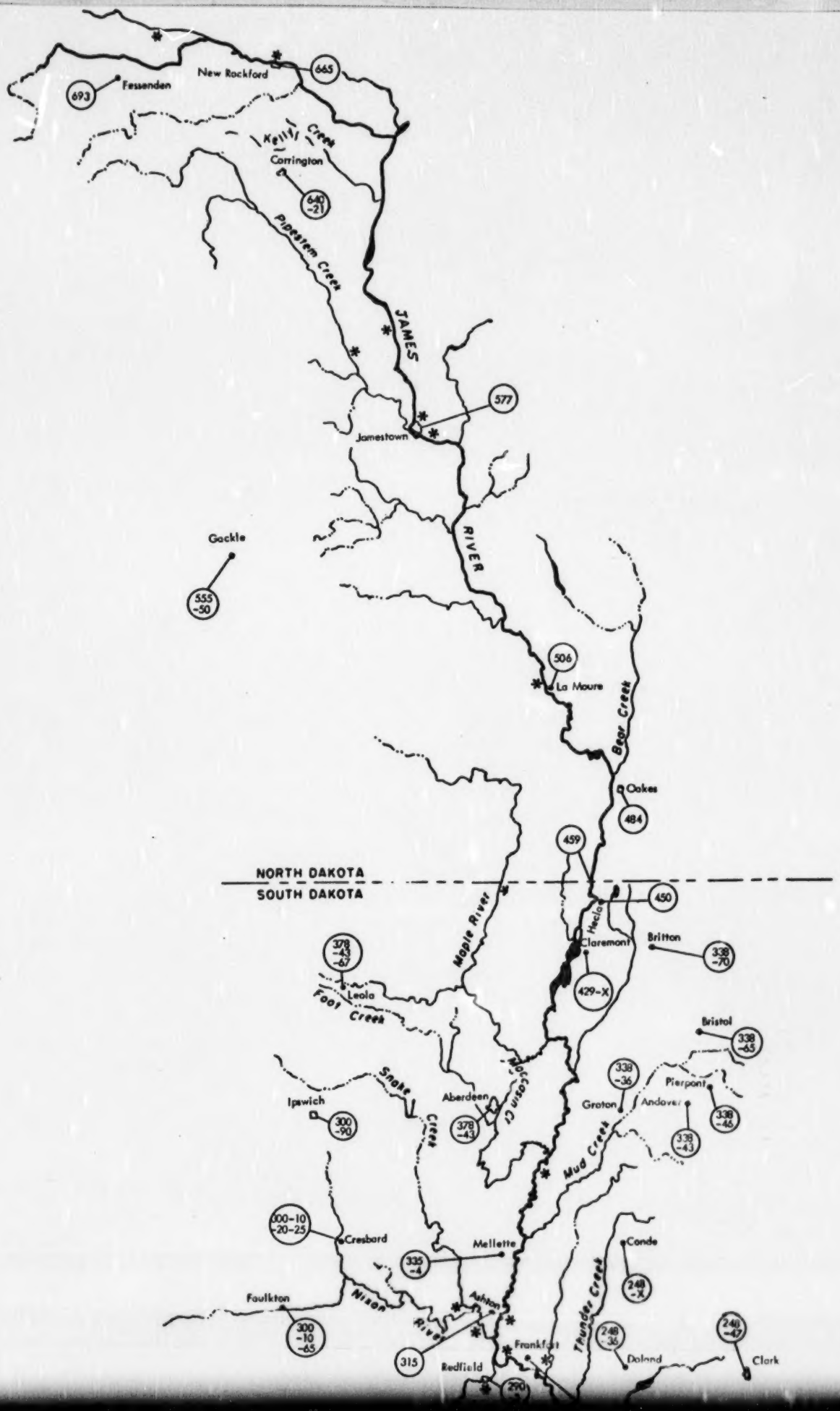
3. U. S. Department of Health, Education, and Welfare, Public Health Service 1957 Inventory, Municipal and Industrial Waste Facilities, 1958, PHS Publication No. 622, Vol. 6.

4. U. S. Department of Interior, Geological Survey, Surface Water Supply of the United States, 1960, Part 6-A, Missouri River Basin Above Sioux City, Iowa, U.S. Government Office, 1961, Geological Survey Water Supply Paper 1709.

APPENDIX A

According to the publication by the U. S. Department of Health, Education, and Welfare, Public Health Service, "1957 Inventory, Municipal and Industrial Waste Facilities," Volume 6, the water uses downstream from the municipalities of LaMoure and Oakes, North Dakota are as follows: livestock watering, game fishing, wildlife and bathing. All of the water uses at and below the North Dakota-South Dakota State Line are not known, but it is assumed that livestock watering, game fishing and wildlife are common uses, and possibly bathing.

The discharge of raw sewage from the cities of LaMoure and Oakes, North Dakota (47 and 25 miles respectively upstream from the state line) undoubtedly interferes with the water uses in South Dakota; however, the extent of these interferences is not known (with the exception of the oxygen depletions as indicated in Section III, "Interference with Water Uses").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Kelly's Creek
Carrington
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Pipestem Creek
JAMES
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La Moure
Bear Creek
Oakes
484
459
NORTH DAKOTA
SOUTH DAKOTA
Maple River
450
Hecla
Claremont
Britton
338
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-43
-67
Leola
Foot Creek
429-X
Bristol
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Pierpont
Groton
Andover
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338
-43
Ipswich
300
-90
Snake Creek
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-43
Mud Creek
300-10
-20-25
Cresbard
Mellette
335
-4
Conde
248
-X
Faulkton
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-10
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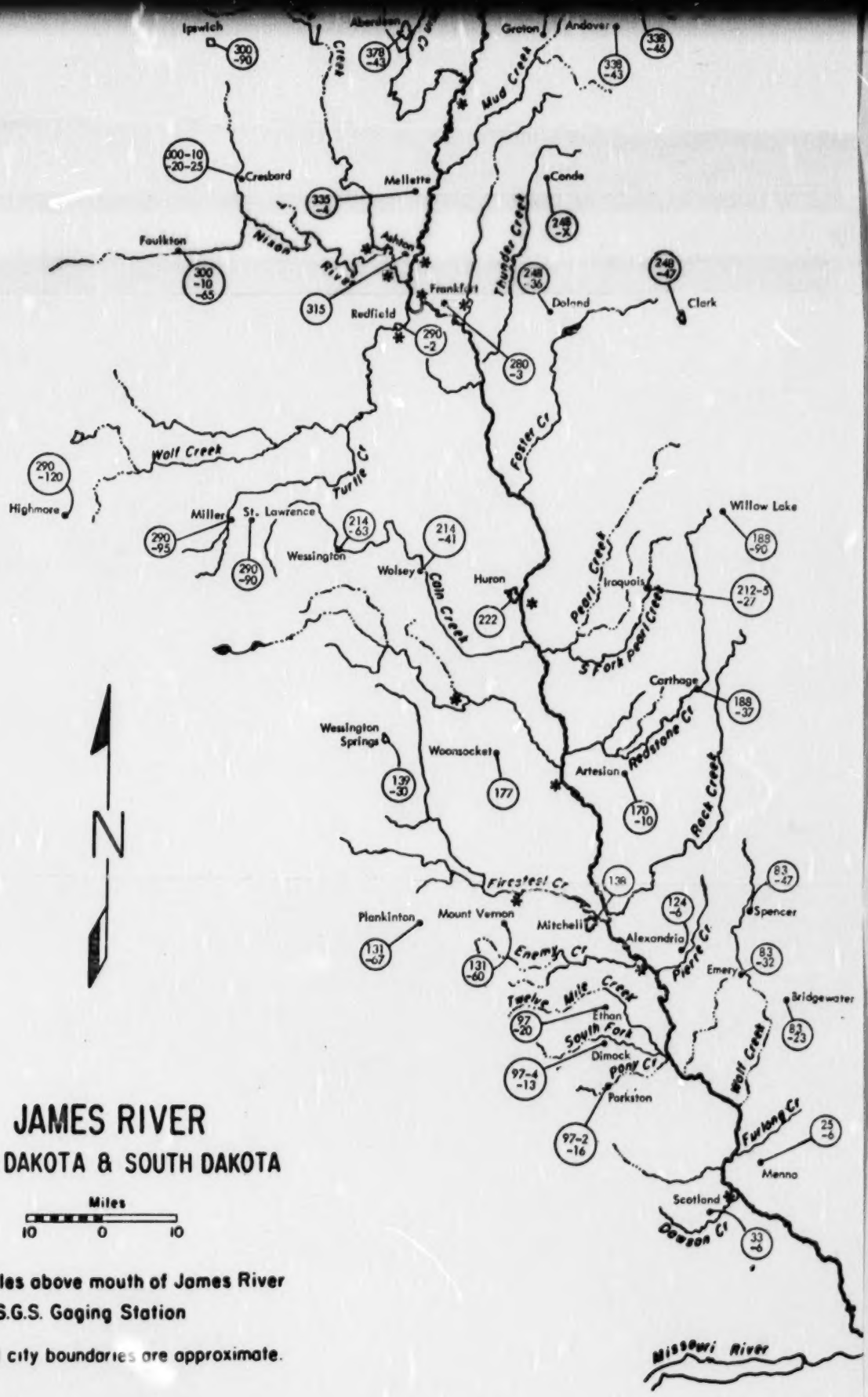

JAMES RIVER

NORTH DAKOTA & SOUTH DAKOTA

Miles

10 0 10

◯ Miles above mouth of James River

* U.S.G.S. Gaging Station

Note: All city boundaries are approximate.